

# 4

Gypsy Moth Manual

## Survey Section

### *Delimiting Survey*

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#### Introduction

The delimiting survey will determine (1) the presence or absence of an infestation and (2) the approximate size of an infestation if present. When a single trap (or several loosely associated traps) catch multiple moths conduct a delimiting survey. The delimiting survey will usually be done in the following year.

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#### Important Features of the Delimiting Survey

The standard delimiting survey trap array is 16 traps per square mile. Special circumstances, such as the presence of sensitive areas or habitats containing endangered species, may require a trap array of more than 16 traps per square mile.

Trapping is at 16 to 36 traps per square mile out to the next negative trap.

The positive trap (or positive traps) will be at the center of the trap array. The survey results from the detection survey will supply information for positioning the trap array.

When conducted after an eradication effort, a delimiting survey is called a post-treatment survey. Use the delimiting survey or mass trapping survey instructions for conducting a post-treatment survey.

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## Materials Needed for Conducting a Delimiting Survey

- ◆ Colored pencils for mapping moth finds
- ◆ County or city road maps
- ◆ Delta Traps
- ◆ First aid kit
- ◆ Grid overlay, calipers, or ruler
- ◆ Disparlure (sex attractant for traps)
- ◆ PPQ Form 343 (Trapping Record) or local form
- ◆ Trap record sheets
- ◆ **PPQ Form 391 (Specimens for Determination)** or **ARS-748 (Identification Request)**
- ◆ Staples, staple gun, roofing nails, hammer, string--where owners won't allow nails (for hanging traps)
- ◆ Small backpack
- ◆ Snake leggings
- ◆ Surveyor's flagging ribbon (marking tape), crayon, or marker for marking trap locations
- ◆ Tick repellent

(You may not need all items listed.)

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## Steps for Conducting a Delimiting Survey:

1. Step 1—Plot Trap Locations on a Map
2. Step 2—Select Sites for Placing Traps
3. Step 3—Set Traps and Mark Locations
  - A. Step 3a—Setting Traps
  - B. Step 3b—Marking Trap Locations
4. Step 4—Check the Traps
5. Step 5—Submit Gypsy Moth Suspects
6. Step 6—Remove Traps
7. Step 7—Report Survey Results
8. Step 8—Complete Survey Maps
9. Step 9—Interpret Survey Results

### Step 1—Plot Trap Locations on a Map

Examine the map from the previous year's detection survey showing all positive traps. When plotting trap locations on a new map, consider the scale of the map and the required trapping density (that is, 16 to 36 traps per square mile). Center the grid on the suspect infestation. Generally, 1 to 4 square miles of delimiting will be sufficient or a ½ to 1 mile boundary (dependent on category of trapping in use in the area of detection). If the suspect area is spread out, it will be necessary to trap a larger area.

Plot trap locations well in advance of the survey season (late winter/early spring). Plotting the traps on planned grids allows for comparison of results from location to location. Do not place traps randomly in the field.

If the map does *not* have a grid, plot trap locations using a ruler or calipers. Following the square mile blocks on most county maps is also a good system.

The scale on a topographic or similar large scale map is appropriate for the delimiting survey.

The following table shows distances for various trap densities.

TABLE 4-1: DISTANCES FOR VARIOUS TRAP DENSITIES

Traps per Square Mile	Distance Between Traps (in feet)
16	1,320
25	1,056
36	880

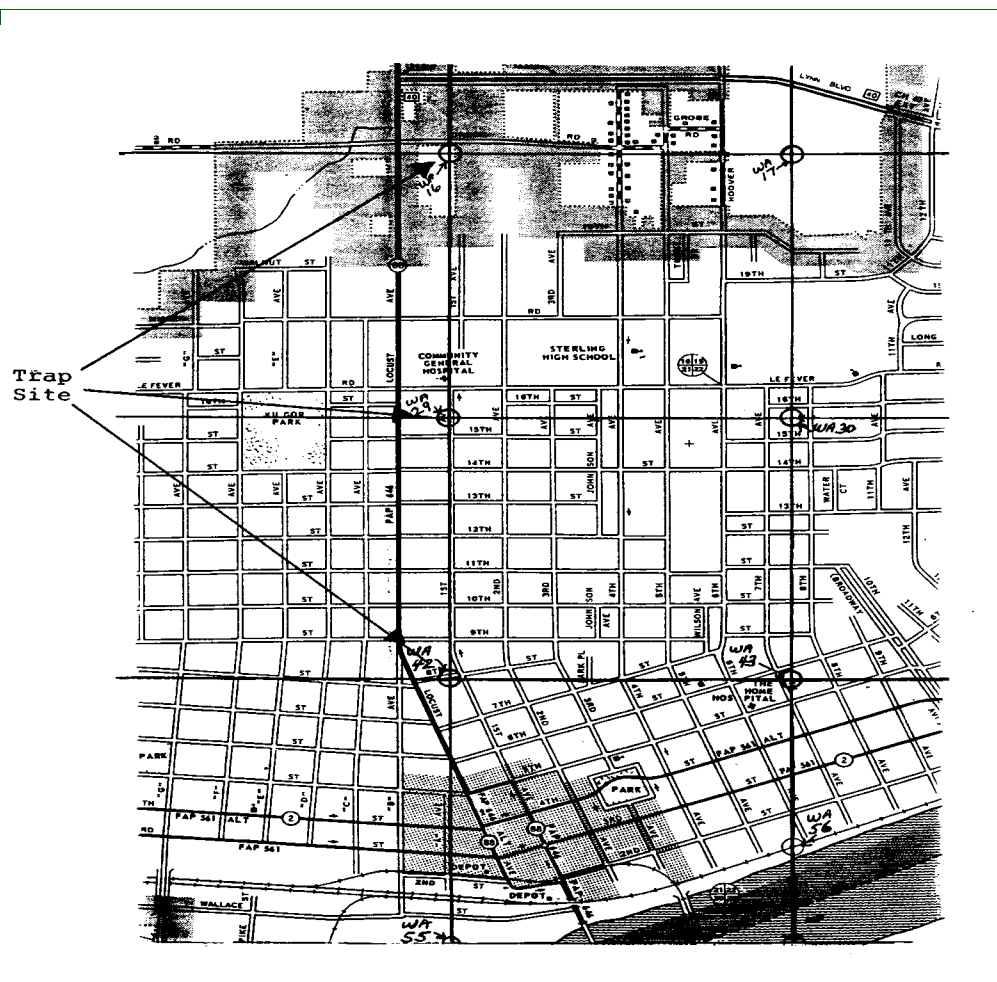


FIGURE 4-1: Example of Traps Plotted for Delimiting Survey

Once trap locations are plotted on the map, number the traps. Number each trap consecutively within a county. Mark the trap number clearly on the map.

### Step 2—Select Sites for Placing Traps

Using the map with the trapping sites plotted, select individual trap sites as close to the plot locations as possible. Try to place all traps on preferred hosts. Host trees are grouped according to gypsy moth preference and are as follows:

**TABLE 4-2: Hosts Preferred by All Larval Instars**

◆ Apple	◆ Boxelder	◆ Speckled alder
◆ Aspen	◆ Larch	◆ Sweet gum
◆ Basswood	◆ Linden	◆ Willow
◆ Birch (except yellow and black)	◆ Mountain ash	
	◆ Oaks (all types)	

**TABLE 4-3: Non-preferred Hosts**

◆ Beech	◆ Hemlock	◆ Pine
◆ Blueberry	◆ Locust	◆ Spruce
◆ Chestnut	◆ Maple	

**TABLE 4-4: Hosts Larvae Avoid**

◆ Arborvitae	◆ Elder	◆ Juniper
◆ Ash	◆ Currant	◆ Poison ivy
◆ Azalea	◆ Grape	◆ Red cedar
◆ Balsam fir	◆ Holly	◆ Sycamore
◆ Butternut	◆ Honeysuckle	◆ Tulip poplar
◆ Cedar	◆ Horsechestnut	◆ Yellow poplar
◆ Dogwood		

### Step 3—Set Traps and Mark Locations:

#### Step 3a—Setting Traps

The timing for setting traps is critical. Set traps before male moths emerge. One way to gauge the date to have all traps set is to determine the earliest date “native” moths were caught in previous years.

Remove lure from package 1 week before use in the field. Lures exposed to air before field use are more effective in trapping moths.

The approximate locations of traps are already marked on a map. Use discretion in selecting the exact location of the traps. Many factors determine where to set a trap in a given area.

Consider the following general rules when setting traps.

1. Male moths usually follow woodland edges and lines of tree growth. Moths do not frequent open areas where there are no trees or shrubs.
2. If available, woodland edges are the best sites for trap placement. Traps are most effective when placed at or near a woodland corner. If there is a choice, place the trap on the windward side so the prevailing wind currents will carry the scent (pheromone) into the woods.
3. If there are no woodlands or residential sites within a reasonable distance (500 to 1,000 feet) from the plotted location, then the best location for a trap is at the end of a hedge row or tree line leading to a wooded area.
4. Place traps 4 to 5 feet high (or eye level if less than 5 feet) on tree trunks because most flight occurs near ground level. In areas frequented by small children or cattle, place the trap out of their sight and reach. Because of vandalism and pilferage, trap placement is especially important when trapping Category S areas (such as recreational parks, campgrounds, and tourist attractions).
5. If possible, place traps in shady areas. Do not set the trap where foliage or branches will block the trap openings.
6. Complete trap record including a sketch showing specific trap location.
7. Avoid setting traps on or in the following situations:
  - A. Close to gravel road (place trap at least 50 feet away)
  - B. Properties that are for sale
  - C. Parks or open areas where people can easily see the traps
  - D. Properties with aggressive dogs
  - E. Private property without the owner's permission
  - F. School properties or along passageways where students walk
  - G. Sites that cannot be accurately described
  - H. Sites where farm animals may damage or destroy traps
    - I. Sites where road construction is scheduled or in progress
    - J. Sites within locked gates
  - K. Sites obscured by tree branches
  - L. Trees having poison ivy vines
  - M. Trees marked for cutting or removal

The distance between traps depends on the trap density that you have selected. If possible, place the traps on preferred hosts or in a preferred habitat; however, never disrupt the required trap array.

### Step 3b—Marking Trap Locations

Marked trap locations will aid both trap tenders and supervisors. To mark a trap location, use plastic flagging ribbon (or marking crayon). Tie a piece of flagging ribbon to a telephone pole, tree trunk, or other suitable object at the roadside. The flagging ribbon should be visible from the road when approaching from either side. Mark trap locations only when necessary because marked traps are prone to vandalism.

Brightly colored plastic tape (fluorescent orange) has proven to be the best flagging ribbon. The marking crayon must be sufficiently soft to mark wet trees. Place a small piece of flagging ribbon near the trap.

In urban areas where streets are named and houses are numbered, use the house address for locating traps. Do not mark trap location with ribbons or marking crayons in urban areas. Also, use restraint in marking roadside rest areas, picnic areas, tourist attractions, and other high use areas where the ribbon will detract from the site's appearance.

### Step 4—Check the Traps

After you have set all the traps, check them on a regular schedule every 10 to 14 days if possible. If a regular schedule is not possible, check each trap site at least once during the trapping season. Check traps more frequently when determining the timing of male emergence (pupae to adult) and when the risk of infestation or vandalism is likely.

Plan your trap checking route before you leave the office. Select a route that will eliminate overlapping travel.

When checking traps, have a supply of replacement traps to replace all vandalized and missing traps. If you replace a trap, number the replacement trap with the same number as the original trap, plus an indicator (such as the letter “R,” for example, 416-R) that it is a replacement trap. Remember to take the lure from the package and expose to air 1 week before use.

When checking traps, do the following:

1. Check overall trap condition and replace badly damaged traps.
2. Check the traps by opening one triangle end. Look into the trap to see if there are any male moths.
3. When a trap contains a suspect moth, remove the trap without disturbing the specimen. Note on the trap record sheet the date and exact location of recovery and tell the supervisor.

4. Record the trap inspection by noting the date on the trap and the PPQ Form 343 (Trapping Record) or local trap record sheet.



MANAGERS: To delimit small infestations precisely, be ready to move rapidly to add or move traps as needed when gypsy moths are found.

### Step 5—Submit Gypsy Moth Suspects

Submit the trap with the suspect moth to your supervisor or designated identifier. Record on the bottom of the trap the date, time, results, and any pertinent observation or action taken.

Record the date and all circumstances about the catch of suspect moths on the trap record sheet. Accurate information is essential to the trapping program. Complete the form each time you check the trap and find a gypsy moth. The data reported is as important as the trap placement. Remember, positive finds may result in the area being declared as gypsy moth infested.

### Step 6—Remove Traps

At the end of the trapping season, remove all traps and examine for gypsy moths. Carefully look for missing traps. If a trap number can't be read, rewrite the number on the bottom of the trap. When removing the trap, remove all other materials (string, nails, staples, wire) used in trapping. Also, remove all flagging tape. Give all traps removed to the person in charge of the survey. For each trap containing a suspect moth, provide the following information: Location (State, county, town), trap number, trap tender's name or identification number, date, and host tree, if known. Open traps on final check because moths can be missed when looking through the trap ends. Flatten empty, used traps and dispose of by burning in an incinerator or by burying at a sanitary landfill.

### Step 7—Report Survey Results

See [Appendix F](#) for instructions on reporting survey data into NAPIS. Do not report into NAPIS until you have all the data collected and summarized by county. NAPIS reports will summarize survey results by county.

### Step 8—Complete Survey Maps

Record all positive trap catches on the survey field map. Survey maps with positive and negative finds are used for postseason review and decision making. At the end of the season, make permanent maps by transferring information from the field maps. Be neat, clear, and accurate when transferring information. It is very important that survey results are accurately placed on the map.



### Step 9—Interpret Survey Results

If the traps do *not* find gypsy moth during the delimiting survey, assume that there is no detectable infestation in the area delimited. If the traps have positive finds, then exclude the boundary traps containing single moths, so that the remaining traps delimit the probable boundaries of the infestation. Generally, traps that contain the highest densities of gypsy moths reveal the center of the infestation.

Inform your and cooperators and supervisor (such as the Senior PPQ Officer, the State Plant Health Director, or the Regional Program Manager) of the infestation. Begin to plan for an eradication effort.

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## Records and Maps

### Records

Maintain a record of all trap locations including any descriptive information needed to help locate traps; use a trap site map or PPQ Form 353. Maintain information such as date set, date inspected, and date removed; maintain a record of trap catches. This information should be recorded on trap record sheet.

Keep a separate record of any egg mass surveys conducted. Use local guidelines for proper record maintenance.

In developing local guidelines for survey records, determine what information is needed and the most efficient manner for recording each item.

Record all positive trap findings and verify trap location on the map.

At the end of the survey season, you must report summary results by county into the NAPIS data base. See [Appendix F](#) for instructions on preparing data for NAPIS.

### Maps

For planning, conducting, and recording a delimiting survey, a topographic map from U.S. Geological Survey with a scale of 1:24,000 is satisfactory. On a city map, the scale should be at least 2 inches per mile. A recent map showing forested areas and new construction is preferable. Maps of a different scale may be used.

Consecutively number every trap location within each county. The type, number, and distribution of maps will vary according to local needs.

Prepare trap maps before the trapping season (the preferred method) using a grid system to assure proper trap distribution. Use a grid, calipers, a ruler, or an overlay to plot trap location. When you use the grid system of plotting trap locations before field placement, adjust trap locations in the field. Make corrections on all maps to show the actual trap locations.

When you add traps to positive trap sites, number the additional traps with the same number as the supplemented trap with a letter added. Example, if trap 25 is supplemented, the first additional trap would be 25a, the second 25b, and so on. When traps are set in recommended grid densities, there is usually no need for supplemental traps.

Staple or glue a map legend to each survey map to indicate the program starting date, completion date, name of trapper, and any other pertinent information.

When using maps for postseason decision making, show both negative and positive trap catches on the map. When determining the pattern of trap catches and establishing treatment boundaries, the negative traps are very important.

### Revising Quarantine Maps

Revise quarantine maps annually on a schedule coordinated with revisions of the regulated area. Use a State map with counties outlined to show proposed revisions to the quarantine map.

Communicate quarantine revision information through channels to your Regional Office.

Regional Offices should submit proposed revisions of the maps to PPQ Program Support in Riverdale, Maryland.